



Thumb Piano

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TOOLS:

- Drill bit (1)
up to 1/4"
- Hacksaw (1)
to trim tines and, if desired, the shim. A hammer can be used instead of a saw to trim spring steel tines — clamp the tine in a vise and strike to bend it until it breaks. Wear eye protection!
- Hand drill (1)
- Screwdrivers (1)
flat blade or Robertson bit for the grounding bar, and whatever type is needed for your chosen fasteners (including hex key)

PARTS:

- Grounding bar (1)
from the electrical section of a hardware store
- Piano body (1)
Examples here include a salad bowl, cigar box lid, wooden box, and aluminum block. You can use almost anything that's easy to hold and strong enough to withstand the fastening of a grounding bar and possibly a shim. Hollow or thin materials are good sound resonators; if your chosen body material doesn't resonate well, attach a resonator.
- Shim (1)
can be a chunk of wood, metal, or plastic, 3/8" thick or thicker
- Fasteners (1)
such as hex screws, machine screws, wood screws, or nails
- Tines (1)
from a material firm enough to vibrate

when plucked, up to 1/4" wide: hairpins,
wire, bicycle spokes, umbrella ribs,
teriyaki skewers, knitting needles, street
sweeper bristles, etc.

- Grounding bar (1)
from the electrical section of a hardware
store
- Salad bowl (1)
- Square dowel (1)
- Spring steel (1)
from your local industrial steel
distributor, trimmed to various lengths
from 2" minimum to 6" maximum
- Wood screws (3)

SUMMARY

The thumb piano, known as a kalimba, mbira, and by many other names, is a lamellaphone that uses prongs called tongues, keys, or tines that you pluck to generate acoustic vibrations. The length of the tine determines the pitch.

Generally, the thumb piano uses some kind of mechanism as an anchor that puts a great deal of pressure over the tines and across 2 bridges, leaving the free lengths of the tines room to vibrate. The tines are usually of the same material and gauge (thickness) to ensure that the pressure is distributed equally, holding everything in place and in tune.

The method shown here is simplified and wonderfully versatile. It allows the use of more fragile, delicate, and unusual materials for the body of the instrument, and it provides a way to use oddly shaped tines of different materials while at the same time permitting the tines to be swapped out and tuned with ease.

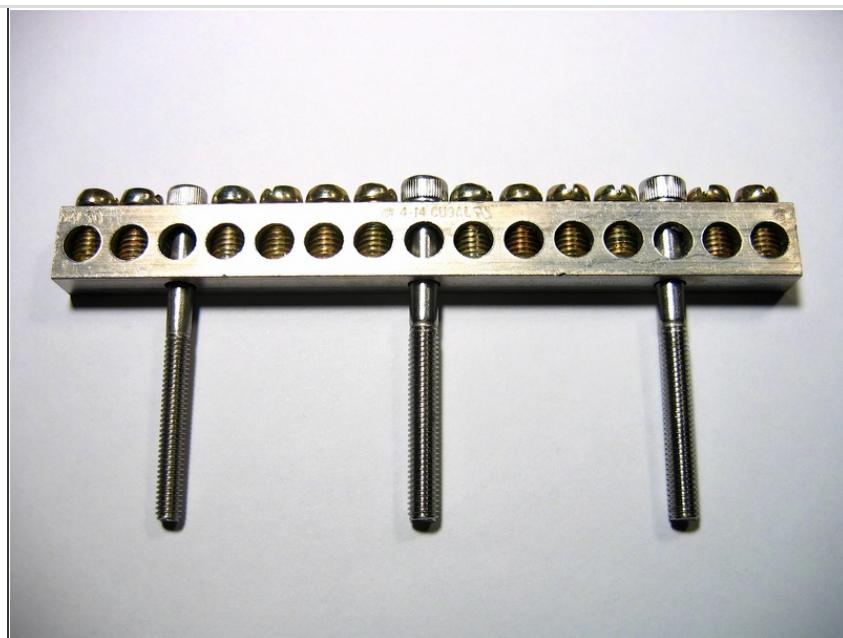
I've included 2 materials lists: a generic list and one that is specific to the salad bowl kalimba shown here. Experiment, explore, and find configurations that work for you.

The tines in the video are made of (from left to right): blue tempered spring steel, hairpin, street sweeper bristle, unknown steel lattice debris, electrician's snake, knitting needle,

street sweeper bristle, bicycle spoke, spring steel, umbrella rib, plastic hobby/craft brush, and plain steel wire with the end splayed by hammering.

The length of a tine determines its pitch. To tune a tine, loosen its screw, scoot it forward or backward a bit, retighten, and plunk.

Step 1 — Fasten the grounding bar.

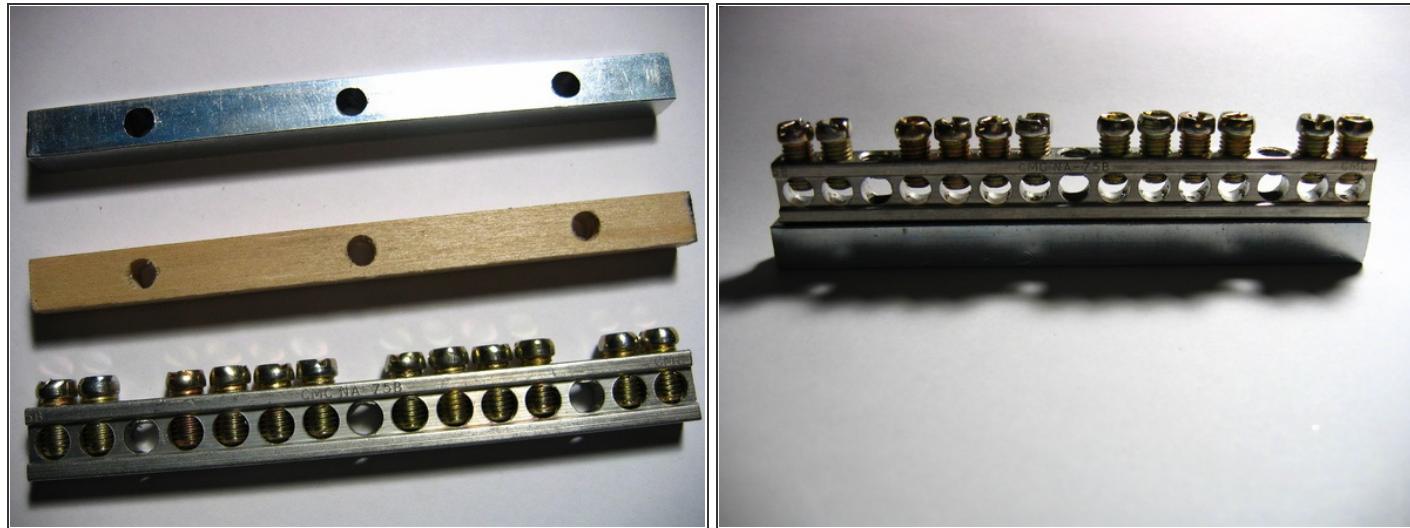


- The grounding bar is used by electricians to ground house circuit wires. It comes in various lengths and can be found in most local hardware stores or builder/contractor supply centers. The empty slots (2, 3, or more) come drilled all the way through — this is where fasteners can be used to attach the bar to something. But you may need to drill through if your slots aren't in the perfect places.

- To anchor the grounding bar, simply make 3 holes with a hand drill into the surface you've chosen to be the body of the instrument. The screws shown in the bottom photo are hex head 10-32 machine screws (smaller and different types of machine screws could be used) secured with T-nuts, speed nuts, or standard nuts with lock washers and fender washers. If screwing into metal, you can use a tap to thread the holes.
- If you're going to mount the bar on wood or thin metal such as a tin can, you may need only a hammer and nail to make the 3 holes. With wood, just use wood screws or something similar. Nails alone might possibly do the job with a bit of wood glue — start the holes with a nail, and add a bit of glue to the holes before driving them firmly.

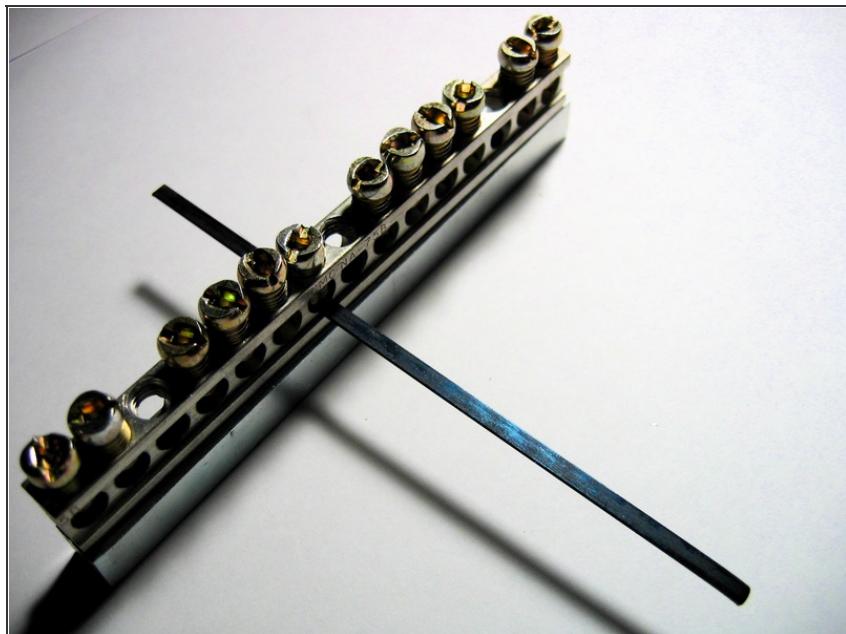
Heavy-duty epoxy, riveting, welding, or even slotting a surface with a milling machine or router are some other ways to anchor the bar.

Step 2 — Add shims, if necessary.



- The tines need room to vibrate, so depending on the type of surface chosen and the way the bar is mounted, you may need to lift the grounding bar up off the instrument body using a shim. This just requires 3 more holes using the grounding bar as a template.
- The top photo shows shims made of 3/8" steel bar and wood square dowels. Plastic, clay, Bondo, Rock Hard Water Putty, or other materials could be used. The shims pictured are trimmed and clean, but they could be made of scraps, rough and with irregular edges, as long as the thickness is consistent.
- The grounding bar provides a way to hold the tines using easily adjustable setscrews. The bottom photo shows the bar on a shim with the screw slots opened. You need a regular flat blade, standard tip screwdriver, or a driver with a Robertson bit.

Step 3 — Add the tines.



- The tine can be anything that will vibrate and that will fit the hole. This photo shows a blue tempered spring steel tine. Crank the screw down tight to anchor the tine. This grounding bar can hold 12.
- Metal tines can be bent away from the instrument to give more vibration room, which makes it easier to play.

Step 4 — Final thoughts.



- If you use a body that has a lip or an edge, like a wooden box or desk drawer, the tines are free to vibrate over the hollow of the receptacle, so a shim isn't necessary.
- The inside of a cigar box lid can provide a shallow receptacle that fits well in the hands. Again, no shim is necessary. The tines shown at right are bamboo teriyaki skewers.
- In the photo is an example of the grounding bar used on unusual materials but in a conventional way. The tines are spring steel and uniform across the span. The body is aluminum, a $\frac{3}{4}$ "-thick block, and there is an aluminum shim.
- I wanted to make something sleek that looks machined, but in actuality I just used a cheap, much-abused drill press. I used a tap to thread the anchor screw holes, putting the tap in the drill press and turning the chuck by hand.
- Surprisingly, the thing is so heavy that a hollow door on sawhorses makes a good resonator for the instrument.

This project first appeared in [CRAFT Volume 06](#), page 38.

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